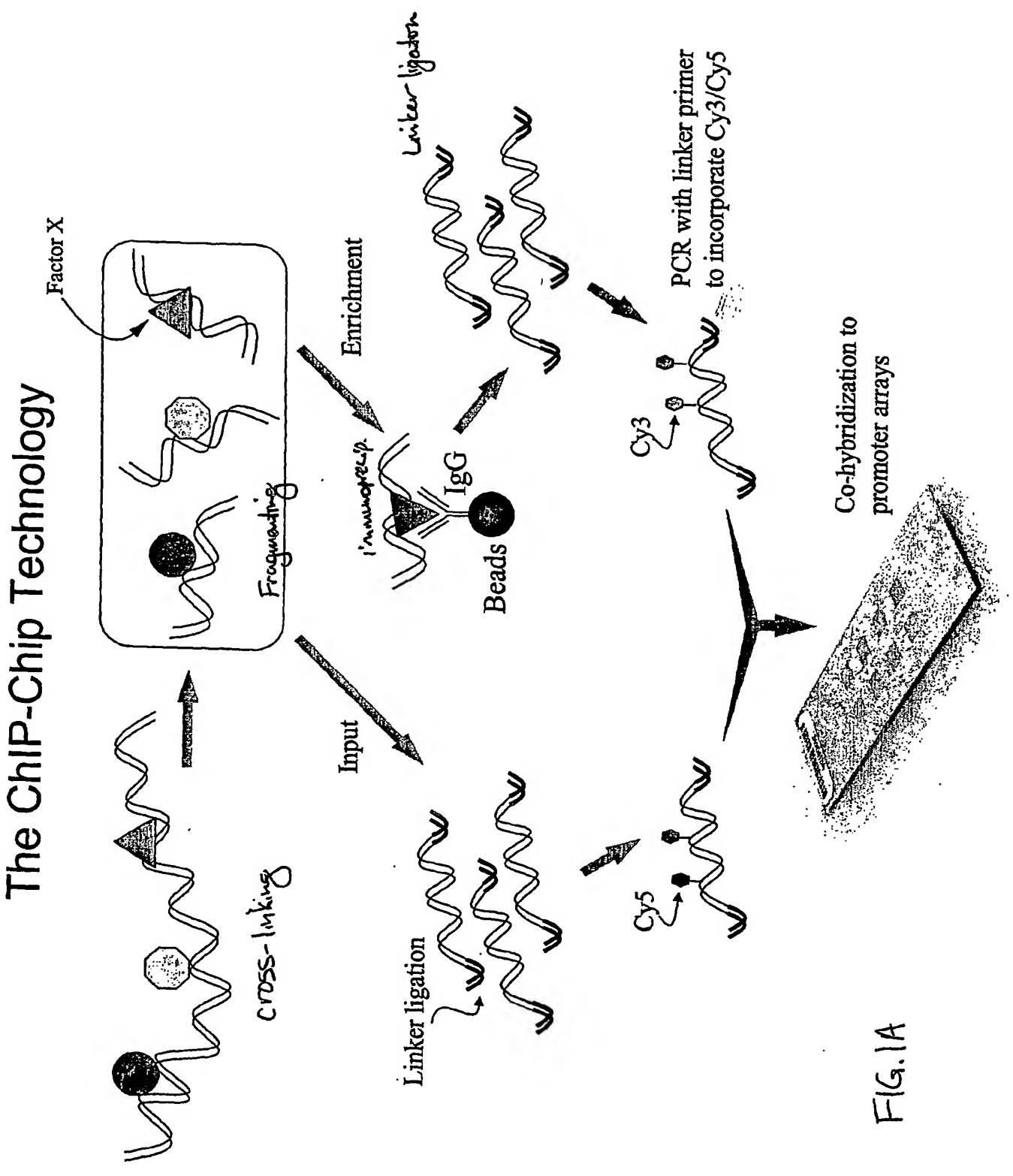

FIG. 1A

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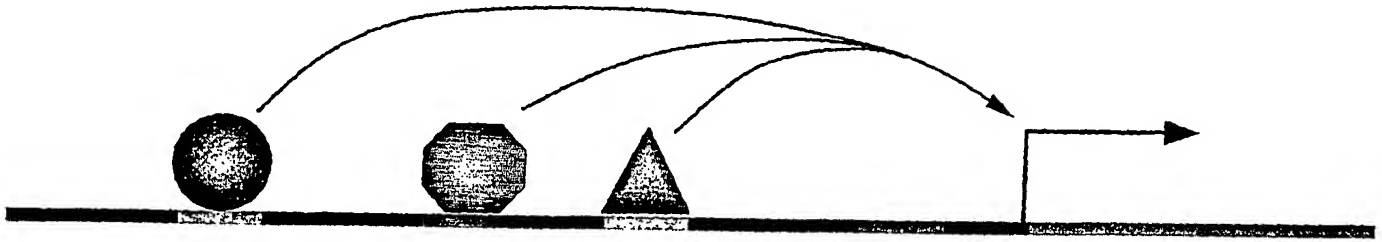
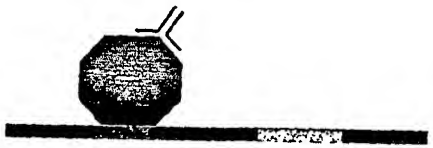
Challenges in Genome-Wide Location Analysis



ChIP (~10^8 cells)

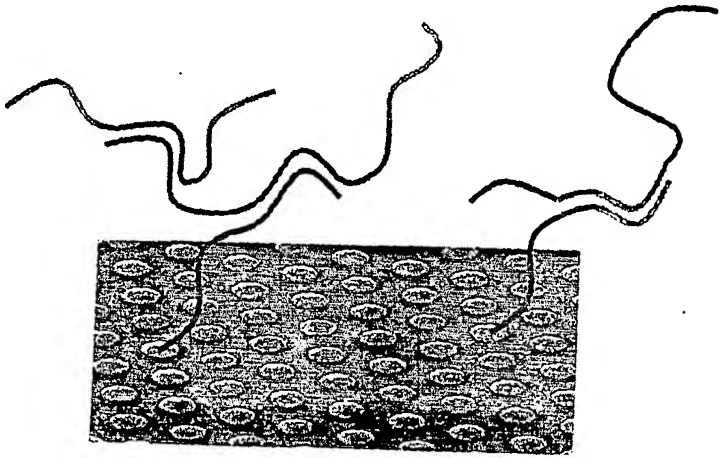
Unique sequences embedded in repeats



Incomplete decrosslinking may interfere with probe conversion

Source of false negatives

Source of false positives



1. IP cond. 1 vs. cond. 2
2. IP+Ag vs. -Ag
3. Total vs. IP

FIG. 1B

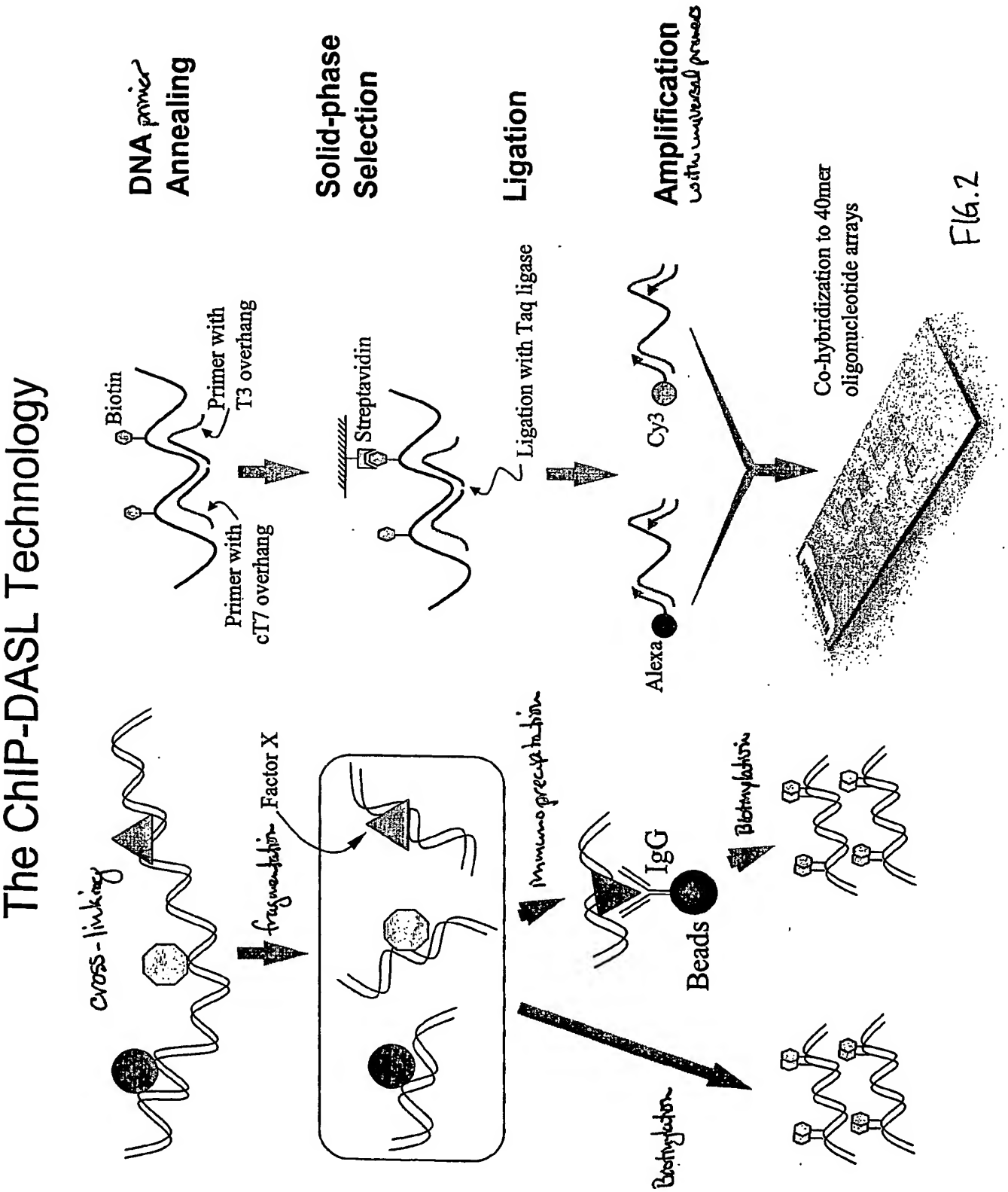

The ChIP-DASL Technology
cross-linking
fragmentation
Factor X
immunoprecipitation
IgG
Beads
Biotinylation
Biotinylation
DNA primer Annealing
Biotin
Primer with T3 overhang
Primer with cT7 overhang
Solid-phase Selection
Streptavidin
Ligation
Ligation with Taq ligase
Amplification with universal primers
Cy3
Alexa
Co-hybridization to 40mer oligonucleotide arrays

FIG. 2

Specificity and Sensitivity of DASL

Reaction #	1	2	3	4	5	6	7	8	9	10
Genomic DNA		10^5	10^5	10^5	10^5	10^5				10^5
Spiked Plasmid DNA			10^2	10^3	10^4	10^5	10^5		10^5	
Oligo Pool for Genomic DNA								+	+	+
Oligo Pool for Spiked DNA	+	+	+	+	+	+	+			

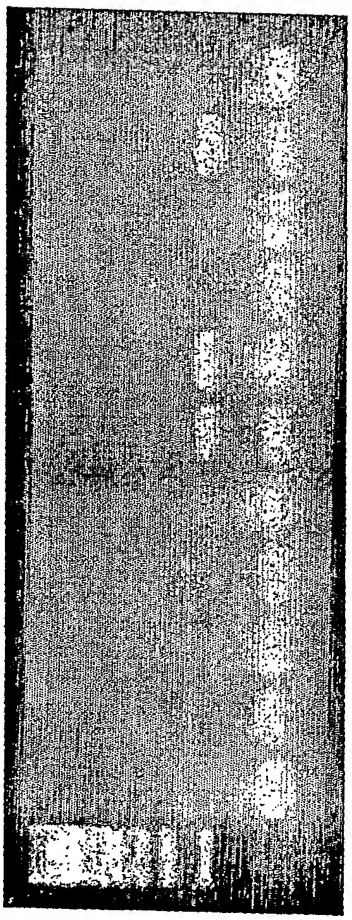


FIG. 3A

Characterization of the ChIP-DASL Technology by using Spiking Controls

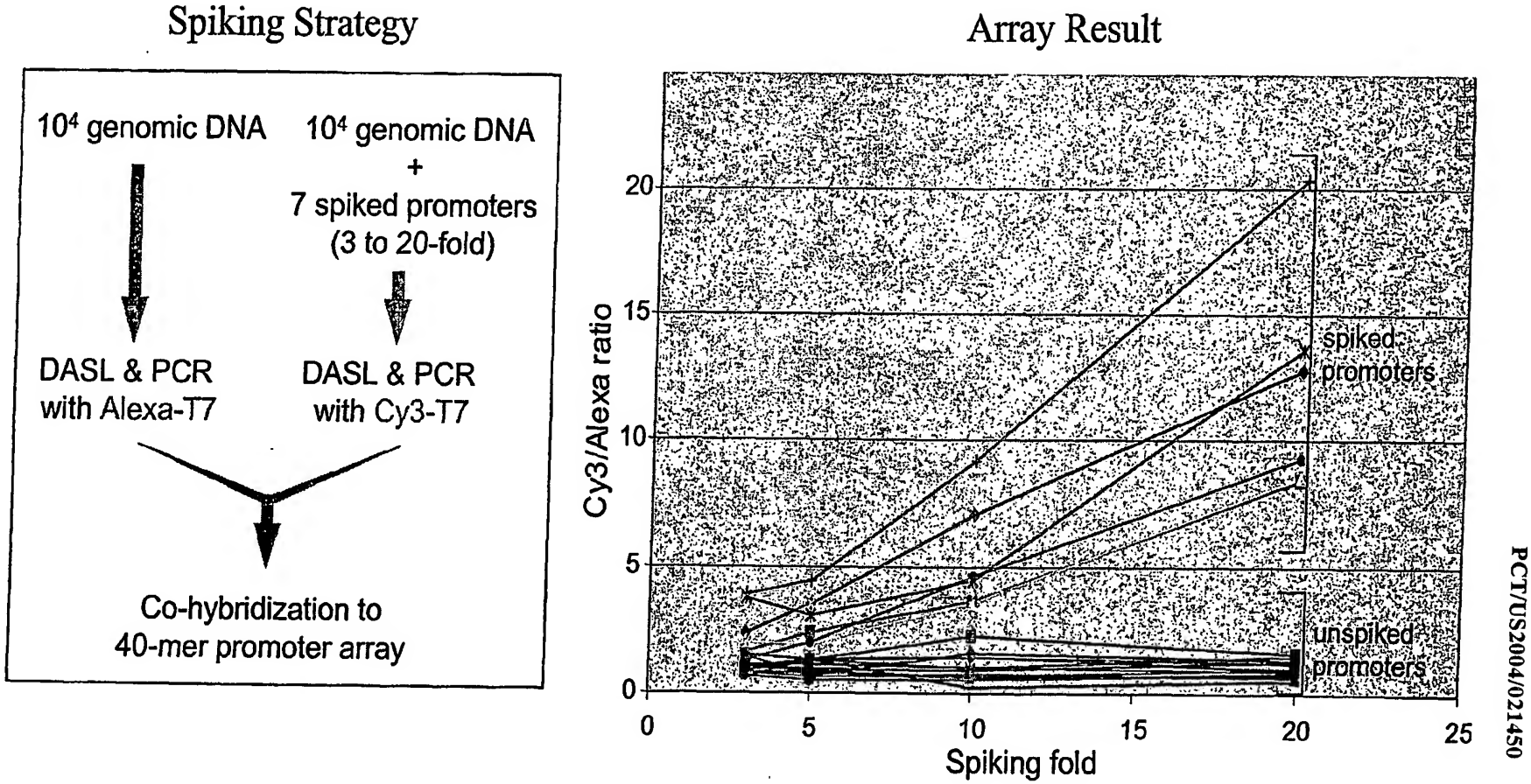


FIG. 3B

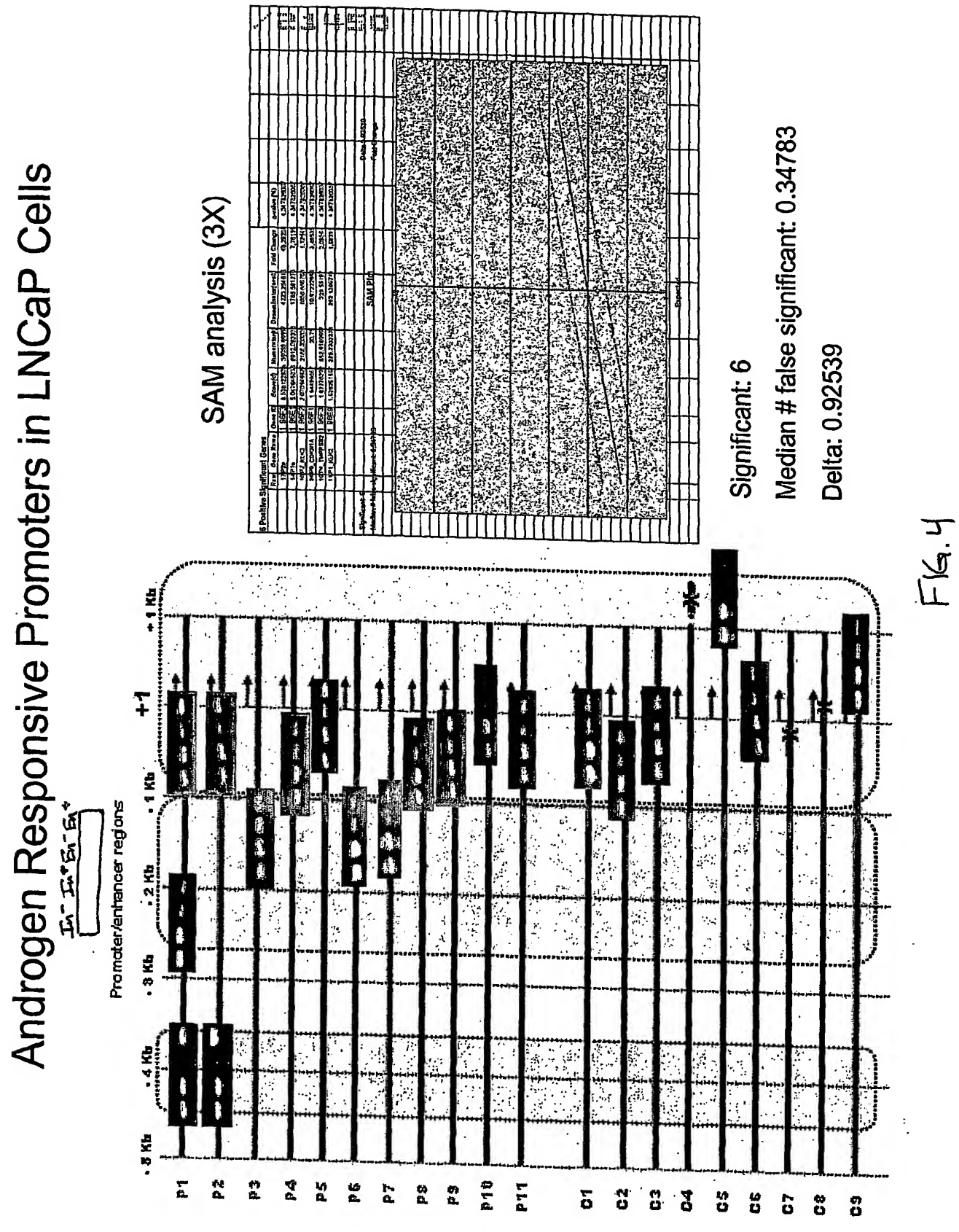

Androgen Responsive Promoters in LNCaP Cells
Promoter/enhancer regions
-5 Kb
-4 Kb
-3 Kb
-2 Kb
-1 Kb
+1
+1 Kb
P1
P2
P3
P4
P5
P6
P7
P8
P9
P10
P11
C1
C2
C3
C4
C5
C6
C7
C8
C9
SAM analysis (3X)
Significant: 6
Median # false significant: 0.34783
Delta: 0.92539

FIG. 4

5-fold Spiking on the 2K Human Promoter Array

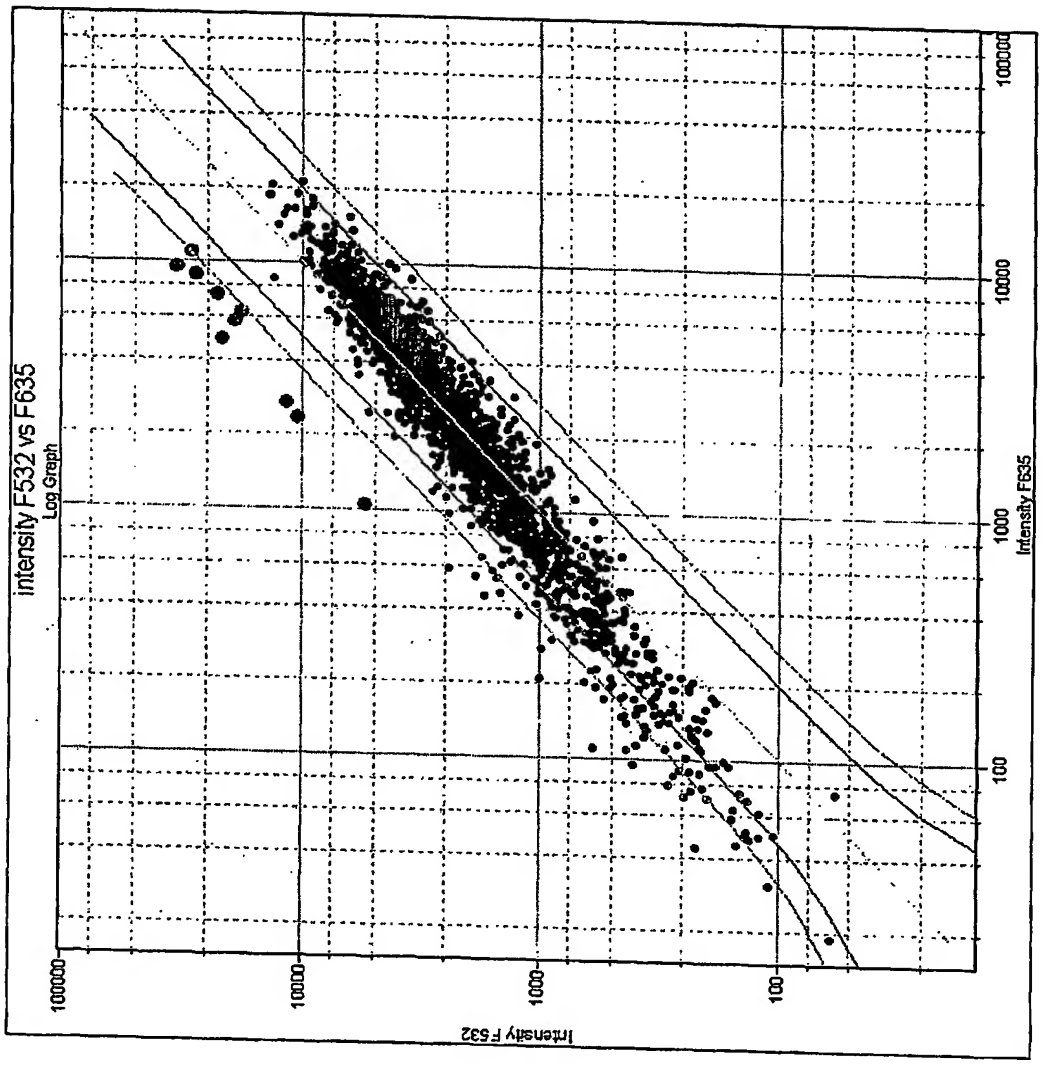


FIG. 5

Identification of Estrogen Receptor Target Genes by DASL

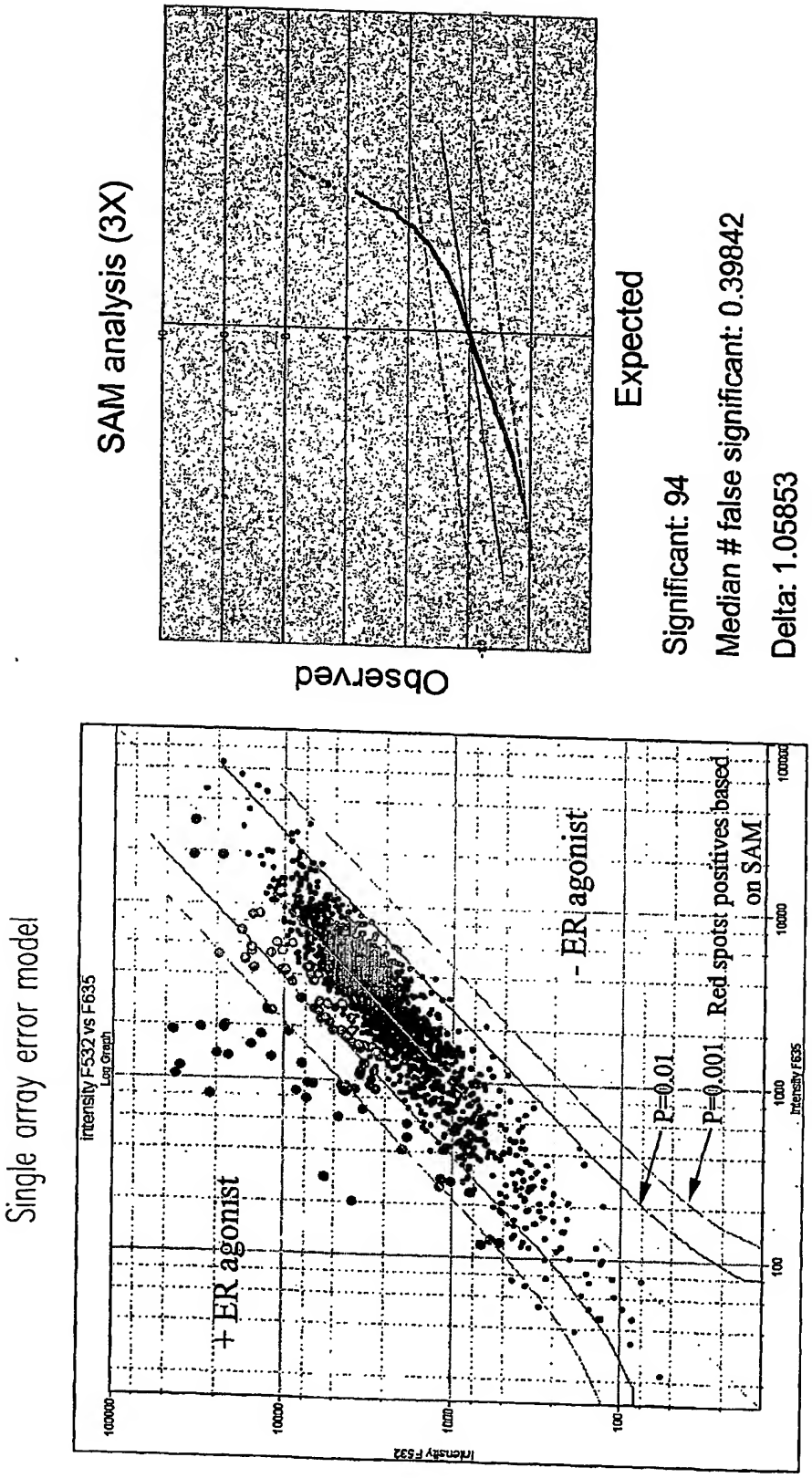


FIG. 10

Mapping Transcription Units by Tiling on the β-globin Locus

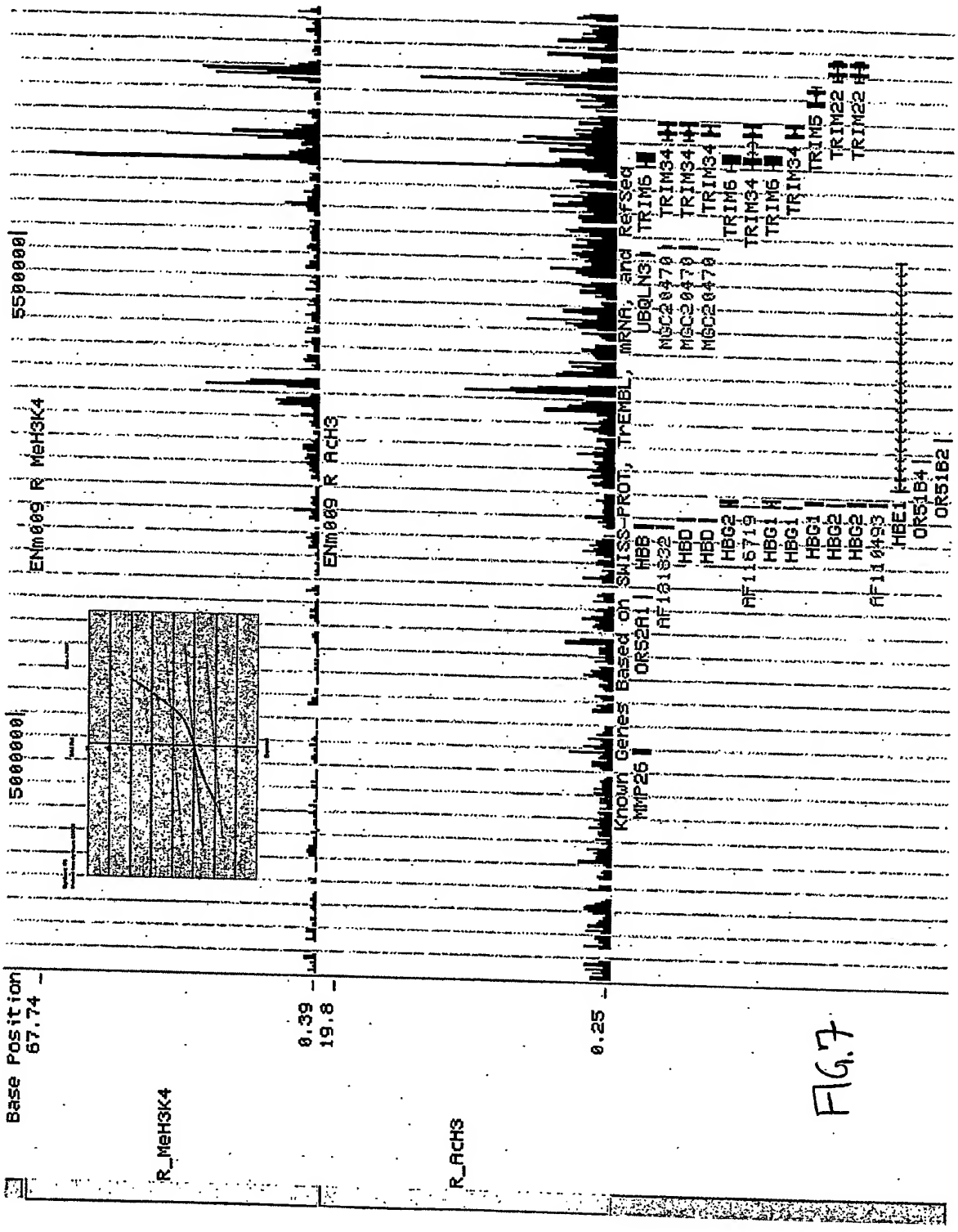


FIG. 7

Mapping Transcription Units by Tiling on the β-globin Locus

Project goal: Mapping functional DNA elements in the ENCODE region
Collaborator: Bing Ren (UCSD)

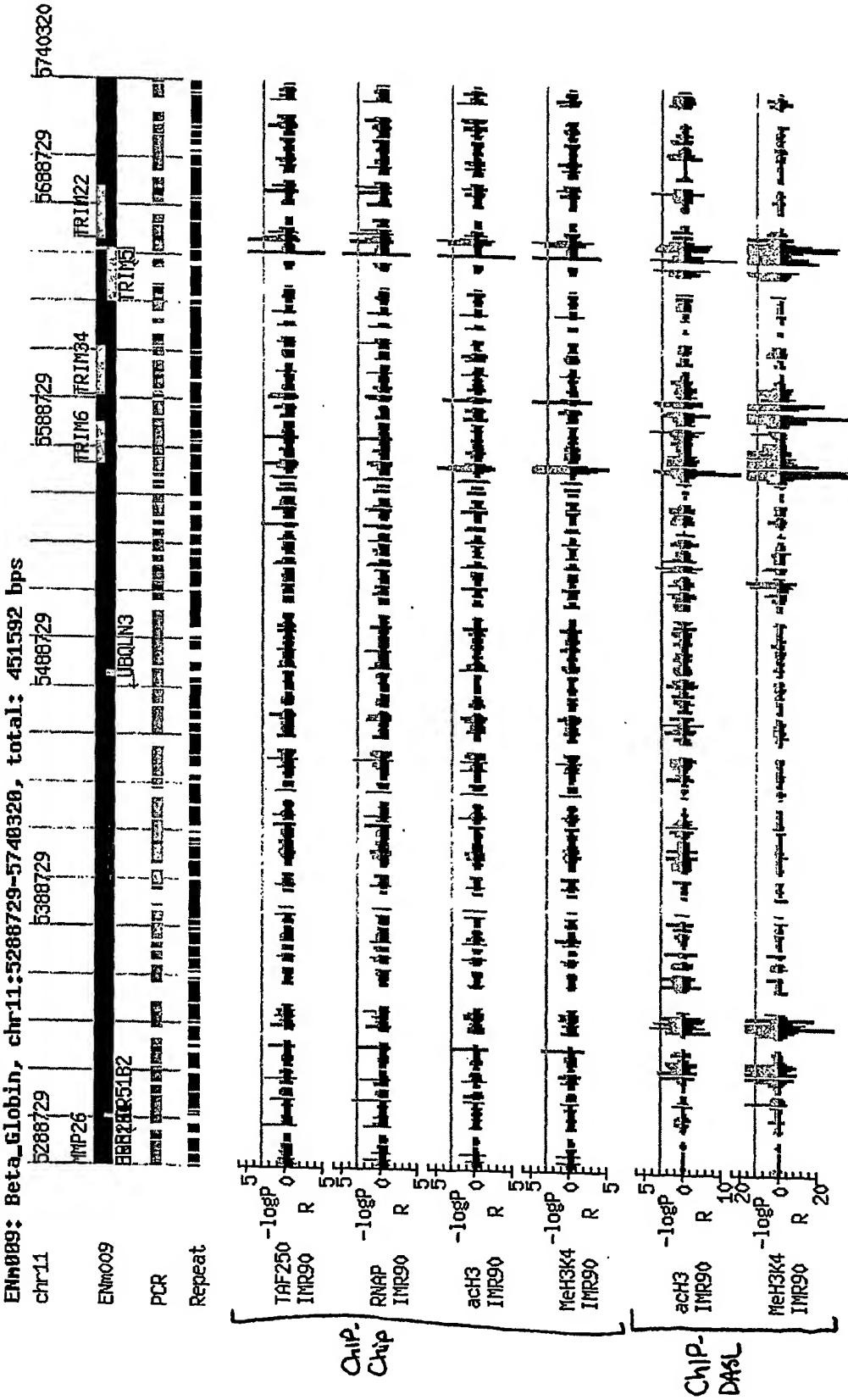


FIG. 9

Additional Applications of DASL

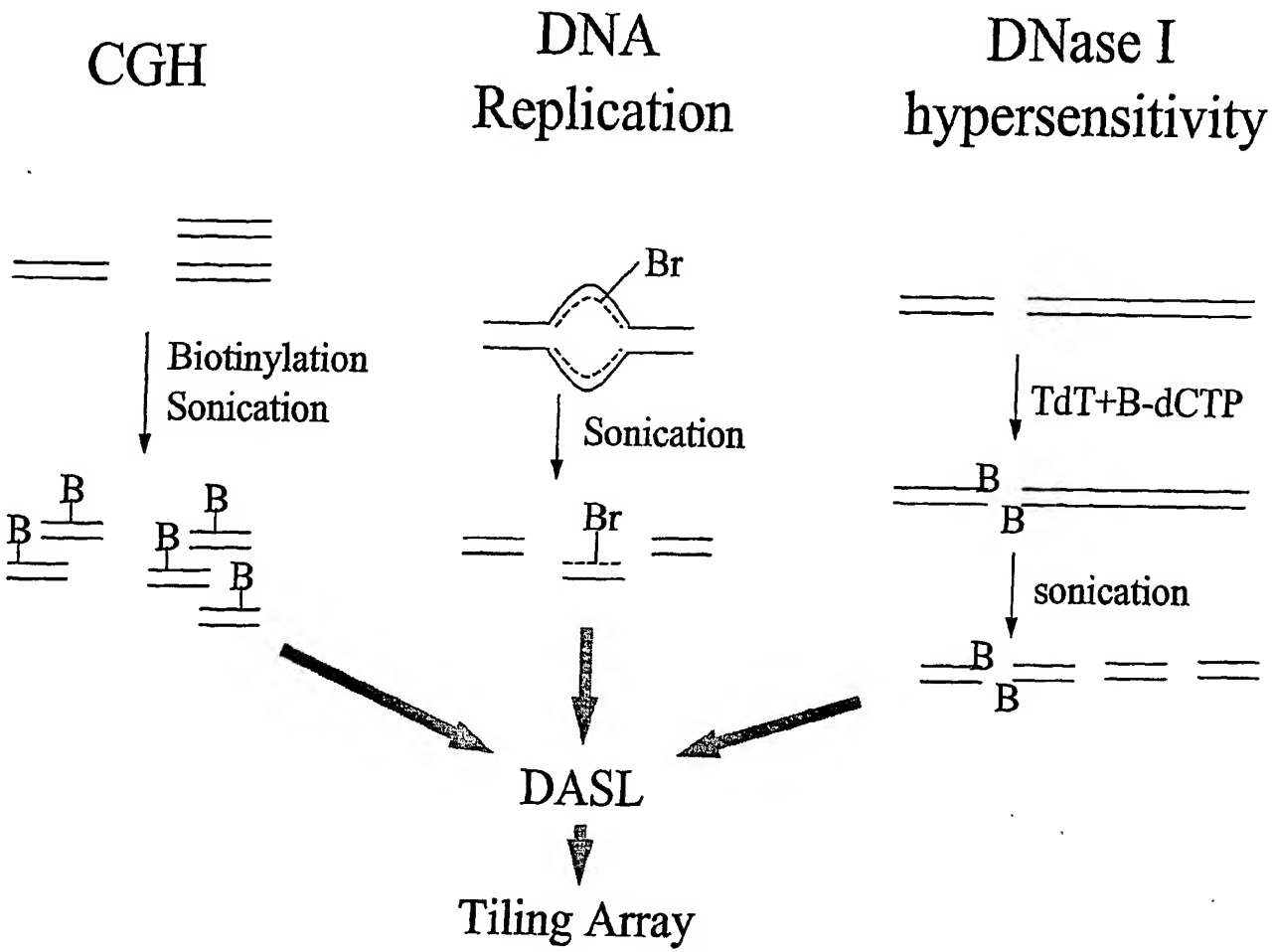


FIG.9

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